

We claim:

1. A vascular stent graft for bypassing a portion of vascular anatomy, the vascular stent graft comprising:
 - a main vessel stent graft extending in the vessel until it is proximate the portion of the vascular anatomy to be bypassed;
 - a bypass stent graft comprising a proximate end and a distal end;
 - the proximate end of the bypass stent graft to be received in an access port on a wall of the main vessel stent graft in a sealing relationship; and
 - the distal end of the bypass stent graft to be positioned in a sealing relationship with the vessel such that the bypass stent graft bypasses the portion of vascular anatomy.
2. The vascular stent graft according to claim 1, wherein the access port on the wall of the main vessel stent graft is established by puncturing the wall of the main vessel stent graft and expanding the puncture in a controlled pattern.
3. The vascular stent graft according to claim 1, wherein the access port is defined by an edge and comprises a seating surface about the edge, and the proximate end of the bypass stent graft comprises an engaging surface, such that when the bypass stent graft is received in the access port, the seating surface and the engaging surface form a seal that inhibits blood flow.
4. The vascular stent graft according to claim 3, further comprising a material between seating surface and the engaging surface.

PATENT
Attorney Docket No. 46620.830007.US1
Express Mail No. EL948575710US

5. The vascular stent graft according to claim 4, wherein the material comprises at least one of a gasket, an epoxy, a resin, an acrylic, a silicone, a glue, and a tape.
6. The vascular stent graft according to 3 wherein at least the proximate end of the bypass stent graft comprises a shaped memory alloy such that on activation, the engaging surface engages the seating surface in a sealing relationship.
7. The vascular stent graft according to claim 1, wherein the proximate end of the bypass stent graft resides in a first vessel and the distal end of the bypass stent graft resides in a second vessel.
8. The vascular stent graft according to claim 1, further comprising a branch connecting stent coupling the main vessel stent graft and the bypass stent graft, the branch connecting stent couples the main vessel stent graft and the bypass stent graft in the sealing relationship.
9. The vascular stent graft according to claim 3, wherein the proximate end of the bypass stent graft is flared.

PATENT

Attorney Docket No. 46620.830007.US1

Express Mail No. EL948575710US

10. A vascular stent graft for removing a portion of vascular anatomy from circulation but preserving circulation to branch vessels, the vascular stent graft comprising:

 a main vessel stent graft; and

 at least one branch connecting stent graft, wherein

 each of the at least one branch connecting stent grafts to be received in an access port on a wall of the main vessel stent graft such that a distal end of the branch connecting stent graft will reside in a branch vessel and a proximate end of the branch connecting stent graft will form a sealing relationship with the access port.

11. The vascular stent graft according to claim 10, wherein

 the access port on the wall of the main vessel stent graft is formed by puncturing the wall of the main vessel stent graft and expanding the tear in a controlled pattern.

12. The vascular stent graft according to claim 10, wherein

 the access port is defined by an edge and a seating surface resides about the edge, and

 the proximate end of the branch connecting stent graft comprising an engaging surface, such that when the branch connecting stent graft is received by the access port, the seating surface and engaging surface form the sealing relationship.

13. The vascular stent graft according to claim 10, wherein the at least one branch connecting stent graft comprises a plurality of branch connecting stent grafts.

PATENT
Attorney Docket No. 46620.830007.US1
Express Mail No. EL948575710US

14. The vascular stent graft according to claim 12, wherein at least the proximate end of the branch connecting stent graft comprises an expandable material such that the proximate end is expanded until the engaging surface and the seating surface form a sealing relationship.

15. The vascular stent graft according to claim 13, wherein the proximate end of the branch connecting stent graft is flared.

PATENT

Attorney Docket No. 46620.830007.US1

Express Mail No. EL948575710US

16. A vascular stent graft for removing a portion of vascular anatomy from circulation but preserving circulation to branch vessels, the vascular stent graft comprising:

a main vessel stent graft;

at least one branch stent graft; and

a corresponding number of connecting stents, wherein

the at least one branch stent graft comprises a distal end and a proximate end, the proximate end residing about a wall of the main vessel stent graft, the proximate end having at least one radiopaque marker;

the wall of the of the main vessel being designed to form an access port for each branch stent graft such that each of the access ports are aligned with proximate end, the alignment being identifiable by the at least one radiopaque marker;

each of the connecting stents having a main vessel seating surface and a branch vessel seating surface, such that the main vessel seating surface engages the wall of the main vessel stent graft in a sealing relationship and the branch vessel seating surface engages a wall of the branch stent graft in a sealing relationship.

PATENT

Attorney Docket No. 46620.830007.US1

Express Mail No. EL948575710US

17. The vascular graft stent according to claim 16 wherein the main vessel seating surface is flared.

18. The vascular graft stent according to claim 17 wherein the branch vessel seating surface is expandable such that the branch vessel seating surface is flush with the wall of the branch stent graft.

PATENT
Attorney Docket No. 46620.830007.US1
Express Mail No. EL948575710US

19. A vascular stent graft comprising:
 - a first stent graft;
 - the first stent graft comprises a port in a wall;
 - a second stent graft;
 - the second stent graft being received in the port in the wall; and
 - means for coupling the first stent graft and the second stent graft in a sealing relationship about the port.

PATENT

Attorney Docket No. 46620.830007.US1

Express Mail No. EL948575710US

20. The vascular stent graft according to claim 19, wherein the means for coupling includes at least one of a washer, an epoxy, a resin, a silicone, an acrylic, a glue, and a tape.